Mercury Screening Protocol using the Jerome Mercury Vapor Analyzer

This protocol is be used:

1. as a follow up to the screening conducted using the **Mercury Screening Protocol for Visible Mercury**, or
2. as a combined visual and instrument screening for mercury.

Instrument screening will not be conducted if the result of the visual screening was "**not involved.**"

Other mercury vapor analyzers may be used instead of the Jerome Mercury Vapor Analyzer for screening purposes. If so, approval to use other mercury vapor analyzers will be obtained from the appropriate regulatory agencies before its use.

Section I - Jerome Mercury Vapor Analyzer Maintenance Procedures

1. Each morning, replace the dust filter, clean the gold film sensors and balance the analyzer following instructions in the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference.

2. Each evening, clean the gold film sensors and recharge the unit's battery pack following instructions in the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference.

If a visual screening for mercury has <u>not</u> been performed, first follow steps 1 through 5 of the **Mercury Screening Protocol for Visible Mercury**, then proceed to Section II. If a visual screening for mercury <u>has</u> been performed, proceed to Section III.

Based on actual field conditions, additional actions may be taken or omitted from this protocol.

Section II - Combined Visual and Instrument Screening

1. After access is granted, take the initial test at the threshold using the zero filter until two consecutive readings less than .003 mg/m^3 are obtained. Follow the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference for complete instructions. Record findings on the **Mercury Screening Record.**

2. Sample at the following location, at a minimum, following the instructions in the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference:

    - Main floor at waist height, following path of regulator removal

    If sampling results are greater than or equal to .003 mg/m^3, test for potential interference by resampling using the zero filter. Look for cat litter boxes, sulfur-containing or ammonia containing cleaners, other sulfur-containing materials or other sources of interference as indicated by meter manufacturer.

    - If test results indicate that the meter is registering interference, arrange for a test by an alternate method
        - Inform the resident of the results and that a follow-up team will conduct further testing
        - Leave an appointment card
        - Notify Team Leader of the situation
        - Proceed with search for the old service entrance
    - If no interference is indicated, proceed with the screening
    - Record findings on the **Mercury Screening Record**

3. Enter the basement. Put new disposable booties over shoes at the bottom of the basement stairs. If there is no basement, search the house for a utility room, closet area, etc. Put new disposable booties over shoes before entering the area (or room) where it is likely that the old service was located.

4. Sample at the following locations, at a minimum, following the instructions in the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference:

    - Basement floor at bottom of stairs (6" above floor)
    - Basement (waist height)

    If sampling results are greater than or equal to .003 mg/m^3, test for potential interference by resampling using the zero filter. Look for cat litter boxes, sulfur-containing or ammonia containing cleaners, other sulfur-containing materials or other sources of interference as indicated by meter manufacturer.

    - If test results indicate that the meter is registering interference, arrange for a test by an alternate method. Record findings on the **Mercury Screening Record.**
        - Inform the resident of the results and that a follow-up team will conduct further testing
        - Leave an appointment card
        - Notify Team Leader of the situation
    - Proceed with the search for old service entrance
    - If no interference is indicated, proceeding with screening

- If no interference is indicated, proceeding with screening
- Record findings on the **Mercury Screening Record**

5. Search the area for evidence of the old service entrance, scanning the area for visual confirmation of mercury in the house by holding a flashlight at an angle to surrounding surfaces and looking for any small, shimmering droplets, puddles or beads.

6. If an old service entrance cannot be located, inform the resident of the findings, remove disposable booties and place them in "used material" bag at the same location as they were put on.

   - If all results are below .003 mg/m^3 and no visible mercury is observed, inform resident that the house is clear, then proceed to the next house.
   - If any results are .003 mg/m^3 or above, proceed to Step 9, omitting further testing around the service entrance, which cannot be located.

7. If an old service entrance exists, visually inspect the area surrounding the location of the old inside mercury regulator for the presence of mercury. Closely inspect cracks or crevices in the floor as well as the area where the floor meets the wall.

   - If there is any substance that may be mercury:
     - STOP, check the soles of the booties for any shiny silver spots to ensure that mercury was not tracked during the screening. If it was tracked, STOP, contact the Team Leader and hold position until the Team Leader arrives
     - Cover the visible mercury with mercury suppressant powder
     - Remove all people from the area and close any doors or vents leading to it
     - Notify the Team Leader of the situation for further action to be taken
   - If there is no substance that may be mercury observed, ask the customer if they have ever observed anything that they suspected may be mercury in the house. If the resident reports that they have observed substances that they believed to be mercury inside the house:
     - Ask the resident what they did with the substance (vacuumed it up, swept it up, wiped it up, etc.)
     - Write **"mercury detected: customer"** on the **Mercury Screening Form**

8. Sample at the following locations, at a minimum, following the instructions in the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference:

   - Former regulator location (6" above floor)
   - Former regulator location (waist height)
   - Inside closet or other enclosure, if regulator was enclosed

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If sampling results are greater than or equal to .003 mg/m^3, test for potential interference by resampling using the zero filter. Look for cat litter boxes, sulfur-containing or ammonia containing cleaners, other sulfur-containing materials or other sources of interference as indicated by meter manufacturer.

- If test results indicate that the meter is registering interference, arrange for a test by an alternate method
  - Inform the resident of the results and that a follow-up team will conduct further testing
  - Leave an appointment card
  - Notify Team Leader of the situation
- If no interference is indicated, proceed with the screening
- Record findings on the **Mercury Screening Record**

9. If mercury vapor levels are found at or above .003 mg/m^3 only in the basement around the former regulator area, conduct further breathing zone testing in the basement to determine extent of potential airborne mercury vapors.

- Test 3 feet away from the former regulator location
- Test 6 feet away from the former regulator location
- Test any basement living areas at waist height (such as play rooms, bedrooms)
- Conduct other testing as appropriate, including floor level sampling, until area readings are below .010 mg/m^3
- Isolate the area where readings are over .010 mg/m^3
  - Remove all people from the area
  - Close any doors or vents leading to it
- Record findings on the **Mercury Screening Record**
- Remove disposable booties and place them in "used material" bag at the same location as they were put on
- Notify the Team Leader of the situation for further action to be taken

10. If mercury vapor levels are found at or above .003 mg/m^3 but below .010 mg/m^3 in any other part of the house,

- Record findings on the **Mercury Screening Record**
- Notify the Team Leader of the situation for further action to be taken

11. If mercury vapor levels are found over .010 mg/m^3 in any part of the house,

- Conduct other testing as appropriate, including floor level sampling, until area readings are below .010 mg/m^3
- Physically isolate the area where readings are over .010 mg/m^3 using plastic sheeting, tape and similar materials
  - Remove all people from the area
  - Close any doors or vents leading to it

- Record findings on the **Mercury Screening Record**
- Notify the Team Leader of the situation for further action to be taken

12. Provide copies of all meter readings and test results to resident. Proceed to the next house.

13. "Used material" refers to waste material handled and disposed of by Nicor Gas. Screen the head space of the "used material" bags using the Jerome instrument. Consistent readings greater than .01 mg/m^3 indicates the items are contaminated and must be disposed of as hazardous material.

Section III - Instrument Screening Only

1. After access is granted, take the initial test at the threshold using the zero filter until two consecutive readings less than .003 mg/m^3 are obtained. Follow the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference for complete instructions. Record findings on the **Mercury Screening Record.**

2. Sample at the following locations, at a minimum, following the instructions in the Jerome Model 411 Field Reference or the Jerome Model 431-X Field Reference:

   - Main floor at waist height (2-3 feet off floor), following path of regulator removal
   - Basement floor at bottom of stairs (6" above floor)
   - Basement (waist height)
   - Former regulator location (6" above floor)
   - Former regulator location (waist height)
   - Inside closet or other enclosure, if regulator was enclosed

   If sampling results are greater than or equal to .003 mg/m^3, test for potential interference by resampling using the zero filter. Look for cat litter boxes, sulfur-containing or ammonia containing cleaners, other sulfur-containing materials or other sources of interference as indicated by meter manufacturer.

   - If test results indicate that the meter is registering interference, arrange for a test by an alternate method
     - Inform the resident of the results and that a follow-up team will conduct further testing
     - Leave an appointment card
     - Notify Team Leader of the situation
   - If no interference is indicated, proceed with the screening
   - Record findings on the **Mercury Screening Record**

3. If all results are below .003 mg/m^3 and no visible mercury is observed, inform resident that the house is clear, then proceed to the next house.

   - Allow residents to see the meter readings and test results, if requested. Provide copies of test results to the resident.

4. If mercury vapor levels are found at or above .003 mg/m^3 only in the basement around the former regulator area, conduct further breathing zone testing in the basement to determine extent of potential airborne mercury vapors.

   - Test 3 feet away from the former regulator location
   - Test 6 feet away from the former regulator location
   - Test any basement living areas (such as play rooms, bedrooms) – waist height
   - Conduct other testing as appropriate, including floor level sampling, until readings are below .010 mg/m^3
   - Isolate the area where readings are over .010 mg/m^3
     - Remove all people from the area
     - Close any doors or vents leading to it
   - Record findings on the **Mercury Screening Record**
   - Notify the Team Leader of the situation for further action to be taken

5. If mercury vapor levels are found at or above .003 mg/m^3 but below .010 mg/m^3 in any other part of the house,

   - Record findings on the **Mercury Screening Record**
   - Notify the Team Leader of the situation for further action to be taken

6. If mercury vapor levels are found over .010 mg/m^3 in any part of the house,

   - Conduct other testing as appropriate, including floor level sampling, until readings are below .010 mg/m^3
   - Physically isolate the area where readings are over .010 mg/m^3 using plastic sheeting, tape and other similar materials
     - Remove all people from the area
     - Close any doors or vents leading to it
   - Record findings on the **Mercury Screening Record**
   - Notify the Team Leader of the situation for further action to be taken

7. Inform resident of all meter readings and test results. Provide copies of test results to the resident. Proceed to the next house.

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Jerome Model 411 Field Reference

Every morning The table below lists the steps that must be completed each morning.

Step	Action
1	Replace the dust (Fritware) filter.
2	• Connect the AC line power cord and the battery charger cord to the connector at the back of the unit and plug both cords into a 120 V outlet. *Plug both cords into a dedicated outlet.*
3	• Install a zero filter into the unit's intake.
4	• Press the power ON button *Meter displays ".000" (Disregard the momentary 1.888 reading).* **If...** / **Then you should...** LO BAT appears on the display / Recharge the battery pack.
5	• Allow a one (1) minute warm up
6	• Press the Film Heat button. *Display reads ".H.H.H"*
7	• Wait approximately 20 minutes for the process to finish. *DO NOT interrupt the process once it has started.*
8	• Remove both cords and the zero filter from the unit.
9	• Pack the unit up and go to your first inspection location.

Balancing the instrument The following balancing procedure must be performed following every film heat procedure.

Step	Action
1	• Press and hold the sensor status button. **If the display reads...** / **Then you should...** • Greater than .04 / • Turn the bridge balance counter-clockwise until the display reads .04 • Less than .04 / • Turn the bridge balance clockwise until the display reads .04 • .04 / • Do nothing; the instrument is balanced.

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Initial readings The table below lists the steps to follow to take threshold readings.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>• Install the zero filter into the unit's intake.</td></tr>
<tr><td>2</td><td>• Enter the home to be inspected.</td></tr>
<tr><td>3</td><td>• Take and record up to 5 readings inside the home with the zero filter installed.
<table>
<tr><th>If...</th><th>Then you should...</th></tr>
<tr><td>• You observe two consecutive readings of less than .003</td><td>• Remove the zero filter.
• Proceed to taking actual readings.</td></tr>
<tr><td>• You are unable to observe two consecutive readings of less than .003</td><td>• Proceed to step 4.</td></tr>
</table></td></tr>
<tr><td>4</td><td>• Take and record three (3) readings outside of the customer's home with the zero filter installed.
<table>
<tr><th>If...</th><th>Then you should...</th></tr>
<tr><td>• All three readings are less than .003</td><td>• Inform your team leader that you are unable to take a reliable reading at the current time.</td></tr>
<tr><td>• Any reading is .003 or greater.</td><td>• Inform your team leader that your meter may need to be re-calibrated and that you need a new meter.</td></tr>
</table></td></tr>
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Actual readings Actual readings should be taken in accordance with the information and guidelines provided on your inspection sheet. The table below lists the steps to follow if you observe a reading of .003 or greater in a customer's home.

Step	Action
1	Take and record two more readings in the same location.
2	Install the zero filter, take and record three readings in the same location.
3	Remove the zero filter, take and record three more readings in the same location.
4	Compare your readings and consult team leader if appropriate.

Every night The table below lists the steps that must be completed each night.

Step	Action
1	• Connect the AC line power cord and the battery charger cord to the connector at the back of the unit and plug both cords into an outlet. *Plug both cords into a dedicated outlet.*
2	• Press the power ON button. *Meter displays ".000" (Disregard the momentary 1.888 reading).*
3	• Allow a one (1) minute warm up
4	• Press the Film Heat button. *Display reads ".H.H.H"*
5	• Wait approximately 20 minutes for the process to finish. *DO NOT interrupt the process once it has started.*
6	• Allow the unit's battery pack to recharge overnight.

Jerome Model 431-X Field Reference

Every morning The table below lists the steps that must be completed each morning.

Step	Action
1	Replace the dust (Fritware) filter.
2	• Connect the AC power cord to the connector at the back of the unit and plug the cord into a 120 V outlet. *Plug the cord into a dedicated outlet.*
3	• Install a zero filter into the unit's intake.
4	• Press the power ON button *Meter displays ".000" (Disregard the momentary .888 reading).* **If...** / **Then you should...** LO BAT appears on the display / • Recharge the battery pack.
5	• Allow a one (1) minute warm up
6	• Press the Regen button. *Display reads ".H.H.H"* **If...** / **Then you should...** .P.P.P appears on the display / • Verify that the power cord is plugged in. • Verify that the fuse is not blown.
7	• Wait approximately 20 minutes for the process to finish. *DO NOT interrupt the process once it has started.*
8	• Remove the cord and the zero filter from the unit.
9	• Pack the unit up and go to your first inspection location.

Balancing the instrument The following balancing procedure must be performed following every film heat (regeneration) procedure.

Step	Action
1	• Press and hold the zero button. **If the display reads...** / **Then you should...** • H / • Turn the bridge balance counter-clockwise until the display reads 0. • L / • Turn the bridge balance clockwise until the display reads 0. • 0 / • Do nothing; the instrument is balanced.

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Initial readings The table below lists the steps to follow to take threshold readings.

Step	Action
1	• Install the zero filter into the unit's intake.
2	• Enter the home to be inspected.
3	• Take and record up to 5 readings inside the home with the zero filter installed.

If...	Then you should...
• You observe two consecutive readings of less than .003	• Remove the zero filter. • Proceed to taking actual readings.
• You are unable to observe two consecutive readings of less than .003	• Proceed to step 4.

Step	Action
4	• Take and record three (3) readings outside of the customer's home with the zero filter installed.

If...	Then you should...
• All three readings are less than .003	• Inform your team leader that you are unable to take a reliable reading at the current time.
• Any reading is .003 or greater.	• Inform your team leader that your meter may need to be re-calibrated and that you need a new meter.

Actual readings Actual readings should be taken in accordance with the information and guidelines provided on your inspection sheet. The table below lists the steps to follow if you observe a reading of .003 or greater in a customer's home.

Step	Action
1	Take and record two more readings in the same location.
2	Install the zero filter, take and record three readings in the same location.
3	Remove the zero filter, take and record three more readings in the same location.
4	Compare your readings and consult team leader if appropriate.

Every night The table below lists the steps that must be completed each night.

Step	Action
1	• Connect the AC line power cord to the connector at the back of the unit and plug the cord into an outlet. *Plug the cord into a dedicated outlet.*
2	• Press the power ON button. *Meter displays ".000" (Disregard the momentary .888 reading).*
3	• Allow a one (1) minute warm up
4	• Press the Regen button. *Display reads ".H.H.H"*
5	• Wait approximately 20 minutes for the process to finish. *DO NOT interrupt the process once it has started.*
6	• Allow the unit's battery pack to recharge overnight.

Nicor Gas MERCURY SCREENING RECORD 9-00

Date_____

Sample time_____ ☐ a.m. ☐ p.m. Meter No._____

Street address_____ City_____

Sampled by_____ Company: ☐ Nicor Gas ☐ Other_____

Nicor Gas Contact Observing ☐ N/A ☐ Name_____

Instrument type: ☐ Jerome ☐ Other_____ Serial No._____ AM film heat performed ☐ Y ☐ N

Windows: ☐ opened ☐ closed Heat: ☐ on ☐ off A/C: ☐ on ☐ off

Arrange for test by alternate method: ☐ Y ☐ N Potential for false positives: ☐ Y ☐ N

Initial test at threshold with zero filter; must have two consecutive readings registering as zero ____ ____ ____ ____ ____ ____

Col. 1	Col.2	Col. 3	Col. 4	Col. 5	Notes
Sample Location	Temp	Initial Result (mg/m^3) If >.002, proceed to Col. 4	Result with zero filter	Follow-up result without zero filter	Such as Potential Interferences
First floor ambient – waist height					
Basement floor – at bottom step, 6 in. above floor					
Basement ambient – waist height					
At former regulator location – 6 in. above floor					
At former regulator location – waist height					
Inside closet / enclosure, if regulator was enclosed					
Additional sampling locations (identify each):					

Visible mercury detected: ☐ Y ☐ N Location_____

Suppressant applied: ☐ Y ☐ N

Additional visible mercury detected: ☐ Y ☐ N Location_____

Additional suppressant applied: ☐ Y ☐ N

Initial cleanup of suppressed mercury performed: ☐ Y ☐ N

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